Amendments to the Claims

1. (Currently Amended) A method of operating a processing system to classify a feature in time series data. the method comprising:

 processing the time series data ~~with a membership function~~ to generate a ~~hypersurface~~ plurality of hypersurfaces;

 processing the ~~hypersurface~~ hypersurfaces with a plurality of membership functions to identify a ~~cluster~~ plurality of clusters and to classify the clusters into a plurality of cluster types; ~~and~~

 processing the ~~cluster~~ clusters from one of the cluster types to construct ~~to classify~~ the feature; and

 classifying the feature.

2. (Currently Amended) The method of claim 1 wherein processing the hypersurfaces ~~hypersurface~~ to identify the clusters ~~cluster~~ comprises contouring the hypersurfaces ~~hypersurface~~ to form the clusters ~~cluster~~.

3. (Cancelled)

4. (Currently Amended) The method of claim 1 ~~3~~ wherein the cluster types comprise ~~type comprises~~ an atmospheric cluster type.

5. (Currently Amended) The method of claim 1 ~~3~~ wherein the cluster types comprise ~~type comprises~~ a failure mode cluster type.

6. (Original) The method of claim 1 further comprising calculating feature membership values for the time series data based on the classified feature.

7. (Original) The method of claim 6 further comprising detecting outliers in the time series data based the feature membership values.

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8. (Currently Amended) The method of claim 1 wherein the <u>hypersurfaces have</u> <s>hypersurface has</s> a height scale from zero to one.

9. (Currently Amended) The method of claim <u>6</u> <s>1</s> wherein the <u>feature membership values</u> <u>indicate</u> <s>hypersurface indicates</s> confidence values for the time series data.

10. (Currently Amended) <u>The method of claim 1 wherein processing the hypersurfaces</u> <u>with the membership functions to identify the clusters comprises:</u> <s>A method of operating</s> <s>a processing system to classify a feature in time series data, the method comprising:</s>
    <s>processing the time series data with a plurality of membership functions to generate a</s> <s>plurality of hypersurfaces;</s>
    processing the hypersurfaces <s>data</s> to generate a composite hypersurface; <u>and</u>
    processing the composite hypersurface to identify <u>the</u> clusters<s>; and</s>
    <s>processing the clusters to classify the feature</s>.

11-20. (Cancelled)

21. (Currently Amended) A system to classify a feature in time series data, the system comprising:
    an interface configured to receive the time series data; and
    a processing system configured to process the time series data <s>with a membership</s> <s>function</s> to generate a <s>hypersurface</s> <u>plurality of hypersurfaces</u>, process the <s>hypersurface</s> <u>hypersurfaces with a plurality of membership functions</u> to identify a <s>cluster</s> <u>plurality of</u> <u>clusters and to classify the clusters into a plurality of cluster types</u>, <s>and</s> process the <s>cluster</s> <u>clusters from one of the cluster types to construct</u> <s>to classify</s> the feature<u>, and classify the</u> <u>feature</u>.

22. (Currently Amended) The system of claim 21 wherein the processing system is configured to contour the <u>hypersurfaces</u> <s>hypersurface</s> to form the <u>clusters</u> <s>cluster</s>.

23. (Cancelled).

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24. (Currently Amended) The system of claim 21 ~~23~~ wherein the cluster <u>types comprise</u> ~~type comprises~~ an atmospheric cluster type.

25. (Currently Amended) The system of claim 21 ~~23~~ wherein the cluster <u>types comprise</u> ~~type comprises~~ a failure mode cluster type.

26. (Original) The system of claim 21 wherein the processing system is configured to calculate feature membership values for the time series data based on the classified feature.

27. (Original) The system of claim 26 wherein the processing system is configured to detect outliers in the time series data based the feature membership values.

28. (Currently Amended) The system of claim 21 wherein the <u>hypersurfaces have</u> ~~hypersurface has~~ a height scale from zero to one.

29. (Currently Amended) The system of claim <u>26</u> ~~21~~ wherein the <u>feature membership values indicate</u> ~~hypersurface indicates~~ confidence values for the time series data.

30. (Currently Amended) The system of claim 21 wherein: ~~A system to classify a feature in time series data, the system comprising:~~
~~an interface configured to receive the time series data; and~~
    a <u>the</u> processing system <u>is</u> configured to ~~process the time series data with a plurality of membership functions to generate a plurality of hypersurfaces.~~ process the hypersurfaces to generate a composite hypersurface. <u>and</u> process the composite hypersurface to identify <u>the</u> clusters. ~~and process the clusters to classify the feature~~.

31-40. (Cancelled)

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41. (Currently Amended) A software product to classify a feature in time series data. the software produce comprising:

application software configured to direct a processing system to process the time series data ~~with a membership function~~ to generate a ~~hypersurface~~ plurality of hypersurfaces. process the ~~hypersurface~~ hypersurfaces with a plurality of membership functions to identify a ~~cluster~~ plurality of clusters and to classify the clusters into a plurality of cluster types. ~~and~~ process the ~~cluster~~ clusters from one of the cluster types to construct ~~to classify~~ the feature. and classify the feature; and

a storage system that stores the application software.

42. (Currently Amended) The software product of claim 41 wherein the application software is configured to direct the processing system to contour the hypersurfaces ~~hypersurface~~ to form the clusters ~~cluster~~.

43. (Cancelled)

44. (Currently Amended) The software product of claim 41 ~~43~~ wherein the cluster types comprise ~~type comprises~~ an atmospheric cluster type.

45. (Currently Amended) The software product of claim 41 ~~43~~ wherein the cluster types comprise ~~type comprises~~ a failure mode cluster type.

46. (Original) The software product of claim 41 wherein the application software is configured to direct the processing system to calculate feature membership values for the time series data based on the classified feature.

47. (Original) The software product of claim 46 wherein the application software is configured to direct the processing system to detect outliers in the time series data based the feature membership values.

48. (Currently Amended) The software product of claim 41 wherein the <u>hypersurfaces have</u> ~~hypersurface has~~ a height scale from zero to one.

49. (Currently Amended) The software product of claim <u>46</u> ~~41~~ wherein the feature membership values indicate ~~hypersurface indicates~~ confidence values for the time series data.

50. (Currently Amended) ~~A~~ <u>The</u> software product <u>of claim 41 wherein:</u> ~~to classify a feature in time series data, the software product comprising:~~

    <u>the</u> application software <u>is</u> configured to direct <u>the</u> ~~a~~ processing system to ~~process the time series data with a plurality of membership functions to generate a plurality of hypersurfaces,~~ process the hypersurfaces ~~data~~ to generate a composite hypersurface, <u>and</u> process the composite hypersurface to identify <u>the</u> clusters. ~~and process the clusters to classify the feature.~~

    ~~A storage system that stores the application software~~.

51-60. (Cancelled)